1. (Original) A CAD (computer-aided design) system, comprising:

a data processing system comprising a CAD application, the CAD application being executed by the data processing system to generate a CAD model of a physical model, the CAD model comprising a plurality of CAD representations each corresponding to a component part of the physical model; and

a tracking system for generating tracker data associated with a given component part, wherein the tracker data is processed by the data processing system to generate a CAD representation of the given component part and determine the position and orientation of the component part with respect to the physical model as the component part is placed in a desired position in the physical model.

2. (Original) The system of claim 1, further comprising a library for storing CAD representations of component parts used for constructing the physical model.

3. (Original) The system of claim 2, wherein the tracking system comprises:

a stationary tracker source (TS); and

a sensor circuit embedded in the given component part for sensing the position of the given component part with respect to the TS and for generating the tracker data, wherein the sensor circuit stores a part identification (ID) code that is transmitted to the data processing system for the CAD application to retrieve a CAD representation from the library based on the part ID code.

4. (Original) The system of claim 2, wherein the tracking system comprises:

a stationary tracker source (TS); and

a tracker free member (TFM) for sensing its position with respect to the TS and generating the tracker data, wherein the TFM comprises a docking mechanism for connecting the TFM to the given component part at a docking position on the given component part.

5. (Original) The system of claim 4, wherein the docking position is one of arbitrary and pre-determined.

6. (Original) The system of claim 4, wherein the docking mechanism of the TFM insertably engages a receptacle on the given component part.

7. (Original) The system of claim 6, wherein a part ID (identification) of the given component part is encoded by the shape of the receptacle, and wherein the docking mechanism of the TFM senses the shape of the receptacle to identify the part and send a signal to the data processing system to retrieve a CAD representation from the library based on the part ID.

8. (Original) The system of claim 6, wherein the given component part comprises a microchip having a part ID code, the microchip being electrically coupled to the docking mechanism of the TFM upon connection of the TFM to the given component part so as to transmit the part ID to the data processing system to retrieve a CAD representation from the library based on the part ID.

9. (Original) The system of claim 4, wherein the docking mechanism comprises one of a suction device and an adhesion device.

10. (Original) The system of claim 4, further comprising a marking jig for measuring tracker data of relevant points of the given component part to generate a CAD representation of the given component part.

11. (Original) The system of claim 10, wherein the marking jig comprises a fixed reference point.

12. (Original) The system of claim 10, wherein the relevant points include at least one corner of the given component part.

13. (Original) The system of claim 10, wherein the relevant points include all corners of the given component part.

14. (Original) The system of claim 10, wherein the marking jig is configured for measuring tracker data associated with a radius of the given component part.

15. (Original) A method for generating a CAD (computer-aided design) model of a corresponding physical model comprising a plurality of component physical parts, the method comprising the steps of:

generating a CAD representation of a given component physical part based on relevant points of the component physical part;

tracking coordinates of the relevant points of the CAD representation of the component physical part in relation to coordinates of the CAD model as the physical component part is placed in a desired position in the physical model; and

adding the CAD representation of component physical part to the CAD model such that the CAD model comprises an ensemble of individual CAD representations of component physical parts.

16. (Original) The method of claim 15, wherein the step of generating a CAD representation of the component physical part comprises the steps of:

connecting a tracker free member (TFM) to the component physical part at a docking position on the component physical part;

obtaining coordinate data for each of the relevant points of the component physical part;

processing the coordinate data for each of the relevant points to determine the position and orientation of each of the relevant points of the component physical part in relation to the TFM..

17. (Original) The method of claim 16, further comprising the step of rendering an image of the component physical part attached to the TFM using the processed coordinate.

18. (Original) The method of claim 16, wherein the step of obtaining coordinate data for each of the relevant points of the component physical part comprises the steps of:

obtaining a part identification (ID) code associated with the component physical part; and

retrieving pre-stored geometry data and docking position data associated with the component physical part based on the part ID code.

19. (Original) The method of claim 18, wherein the step of obtaining a part ID code comprises the steps of:

insertably engaging a docking mechanism of the TFM with a docking receptacle of the component physical part;

encoding the part ID based on a shape of the docking receptacle;

sensing the shape of the docking receptacle; and

transmitting a corresponding part ID from the TFM based on the sensed shape of the docking receptacle.

20. (Original) The method of claim 18, wherein the step of obtaining a part ID code comprises the steps of:

insertably engaging a docking mechanism of the TFM with a docking receptacle of the component physical part to operatively connect the docking mechanism to a microchip in the component physical part;

retrieving the part ID from the microchip; and

transmitting the retrieved part ID from the TFM.

21. (Original) The method of claim 16, wherein the step of obtaining coordinate data for each of the relevant points of the component physical part comprises the steps of:

obtaining pre-stored geometry data of the relevant points associated with the component physical part;

measuring coordinates of a portion of the relevant points of the component part;

comparing the measured coordinates with the pre-stored geometry data;

computing the docking position of the TFM on the component physical part, if a match is found between the measured coordinates and the geometry data of corresponding relevant points;

determining a remainder of the relevant points of the component physical model based on the computed docking position and geometry data.

22. (Original) The method of claim 21, further comprising the steps of:

rendering images of the component physical part each having an alternative docking position, if a match is not found between the measured coordinates and the geometry data; and

selecting the image with a desired docking position.

23. (Original) The method of claim 16, wherein the step of obtaining coordinate data for each of the relevant points of the component physical part comprises the steps of:

measuring the coordinates of successive relevant points of the component part;

rendering an image of the component physical part, wherein the image is dynamically generated by connecting a line from a current measured point to a last measured point; and

re-connecting the line from the current measured point to any previous measured point, if the rendering of the connection between the current measured point and last measured point is an incorrect depiction of the component physical part.

24. (Original) The method of claim 16, wherein the step of processing the coordinate data for each of the relevant points to determine the position and orientation of each of the relevant points of the component physical part in relation to the TFM comprises the steps of:

computing coordinates of the docking position of the TFM on the component physical part; and

transforming the coordinates of the relevant points to the coordinates of the TFM using the computed docking position.

25. (Original) The method of claim 15, further comprising the step of refining the CAD representation before adding the CAD representation to the CAD model.

26. (Original) The method of claim 15, further comprising the step of storing the CAD representation of the component physical part in a CAD library.

27. (Original) A program storage device readable by a recognition machine, tangibly embodying a program of instructions executable by the machine to perform method steps for generating a CAD (computer-aided design) model of a corresponding physical model comprising a plurality of component physical parts, the method comprising the steps of:

generating a CAD representation of a given component physical part based on relevant points of the component physical part;

tracking coordinates of the relevant points of the CAD representation of the component physical part in relation to coordinates of the CAD model as the physical component part is placed in a desired position in the physical model; and

adding the CAD representation of component physical part to the CAD model such that the CAD model comprises an ensemble of individual CAD representations of component physical parts.

28. (Original) The program storage device of claim 27, wherein the instructions for performing the step of generating a CAD representation of the component physical part comprise instructions for performing the steps of:

obtaining coordinate data for each of the relevant points of the component physical part;

processing the coordinate data for each of the relevant points to determine the position and orientation of each of the relevant points of the component physical part in relation to coordinates of a tracker free member (TFM) attached to the component physical part at a docking position on the component physical part.

29. (Original) The program storage device of claim 28, further comprising instructions for performing the step of rendering an image of the component physical part attached to the TFM using the processed coordinates.

30. (Original) The program storage device of claim 28, wherein the instructions for performing the step of obtaining coordinate data for each of the relevant points of the component physical part comprise instructions for performing the steps of:

receiving a part identification (ID) code associated with the component physical part; and

retrieving pre-stored geometry data and docking position data associated with the component physical part based on the part ID code.

31. (Original) The program storage device of claim 30, wherein the part ID code is received from one of the TFM or by user input.

32. (Original) The program storage device of claim 28, wherein the step of obtaining coordinate data for each of the relevant points of the component physical part comprises the steps of:

obtaining pre-stored geometry data of the relevant points associated with the component physical part;

receiving tracker data from the TFM comprising measured coordinates of a portion of the relevant points of the component part;

comparing the measured coordinates with the pre-stored geometry data;

computing the docking position of the TFM on the component physical part, if a match is found between the measured coordinates and the geometry data of corresponding relevant points;

determining a remainder of the relevant points of the component physical model based on the computed docking position and geometry data.

33. (Original) The program storage device of claim 32, further comprising instructions for performing the steps of rendering images of the component physical part each having an alternative docking position, if a match is not found between the measured coordinates and the geometry data for a user to select the image with a desired docking position.

34. (Original) The program storage device of claim 28, wherein the instructions for performing the step of obtaining coordinate data for each of the relevant points of the component physical part comprise instructions for performing the steps of:

receiving tracker data from the TFM comprising measured coordinates of successive relevant points of the component part;

rendering an image of the component physical part, wherein the image is dynamically generated by connecting a line from a current measured point to a last measured point; and

re-connecting the line from the current measured point to any previous measured point, in response to a signal sent by the user.

35. (Original) The program storage device of claim 28, wherein the instructions for performing the step of processing the coordinate data for each of the relevant points to determine the position and orientation of each of the relevant points of the component physical part in relation to the TFM comprise instructions for performing the steps of:

computing coordinates of the docking position of the TFM on the component physical part; and

transforming the coordinates of the relevant points to the coordinates of the TFM using the computed docking position.

36. (Original) The program storage device of claim 27, further comprising instructions for performing the step of refining the CAD representation before adding the CAD representation to the CAD model.

37. (Original) The program storage device of claim 27, further comprising instructions for performing the step of storing the CAD representation of the component physical part in a CAD library.